



We Deliver the Power™

Advantages of a Company Switch vs. a Safety Switch Receptacle Combination:

Why a Company Switch Delivers Greater Benefits

Overview:

Advantages of a Company Switch vs. a Safety Switch Receptacle Combination

Why a Company Switch Provides Greater Benefits

A company switch provides access to relatively high amounts of electrical power, typically 60 Amps and above, in applications where the equipment utilized changes on a regular basis, such as theaters, studios, convention centers and arenas. Over the past decade or so, they have become the preferred type of product for applications of this nature due to safety and convenience benefits.

Prior to the advent of the company switch, providing access to power in these venues was done the same way as it is done in an industrial factory. This entails an electrician wiring receptacles, typically single pole, Cam-type, in combination with a knife-blade safety switch. This method remains an option and Lex Products is often asked why the more expensive company switch is necessary. When it comes to safety considerations, the answers are plentiful.



The Company Switch Advantage

This article will address safety and performance benefits delivered by a Lex Products PowerGATE™ Company Switch over the safety switch receptacle combination. Also, because not all company switches are created equal, specific features will be highlighted that are proprietary to the patented Lex Products PowerGATE™ Company Switch.

Topics addressed include product design and construction details regarding the need for restricted access, the elimination of the ability to make or break connections under load, the capability to properly reset overcurrent protection, the benefits of electronic circuit breakers over fuses and thermal magnetic circuit breakers, and overall safety regulation factors.

Lockable Door Prohibits Access to Receptacles

With a PowerGATE™ Company Switch, both Cam-type and lug receptacles are housed behind a lockable access door, which eliminates accidental disconnection, unauthorized access and/or tampering with connections (Figures 1.2, 1.4 and 2.2). In the case of safety switch combinations, receptacles or free-hanging tails are typically accessible to anyone, authorized or not (Figure 2.3).

PowerGATE™ Design Prevents Making or Breaking Connections Under Load

Cam-type connectors are not intended to be mated or unmated under load. The same is true for lug connections. In a PowerGATE™ Company Switch, the access door to the connection is interlocked to the main breaker, which means the breaker cannot be turned on unless the access door is closed. If the access door is opened for any reason, the power automatically turns off, eliminating the ability to make or break a connection under load (Figure 1.6). If a connection were to be made or broken under load using Cam-type connectors, the connectors would become damaged, reducing their lifespan and a potentially dangerous safety arc could occur.

Similarly, making lug connections under load is a banned practice, as it is also a major safety hazard. In theory, the safety switch should be turned off when not in use, but there is no way to guarantee this practice. The auto shut-off feature is not present in all company switch brands, nor in common safety switches (Figure 5.1).

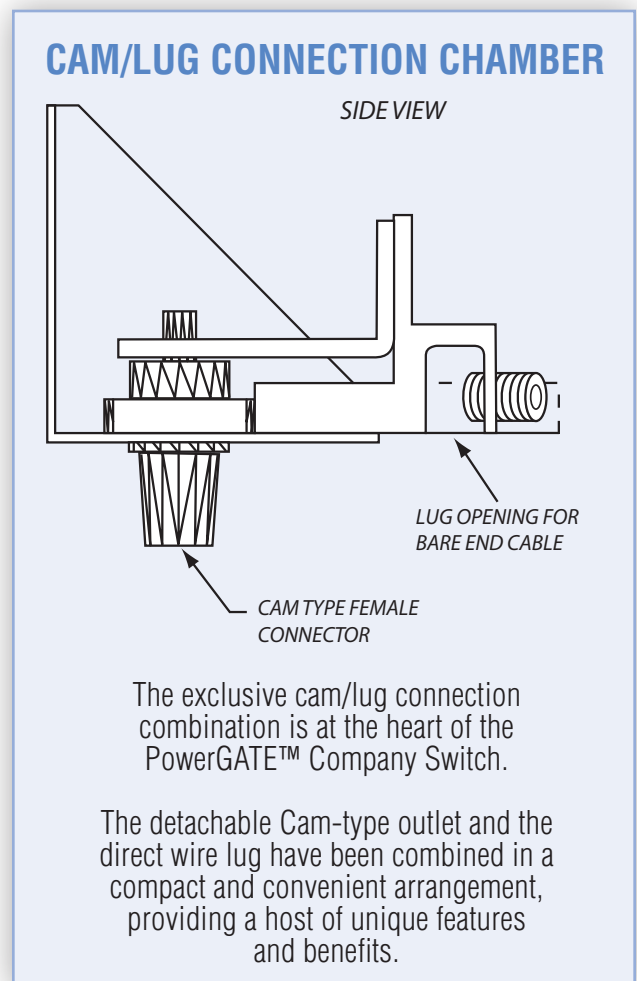


Figure 1

PowerGATE™ Company Switch

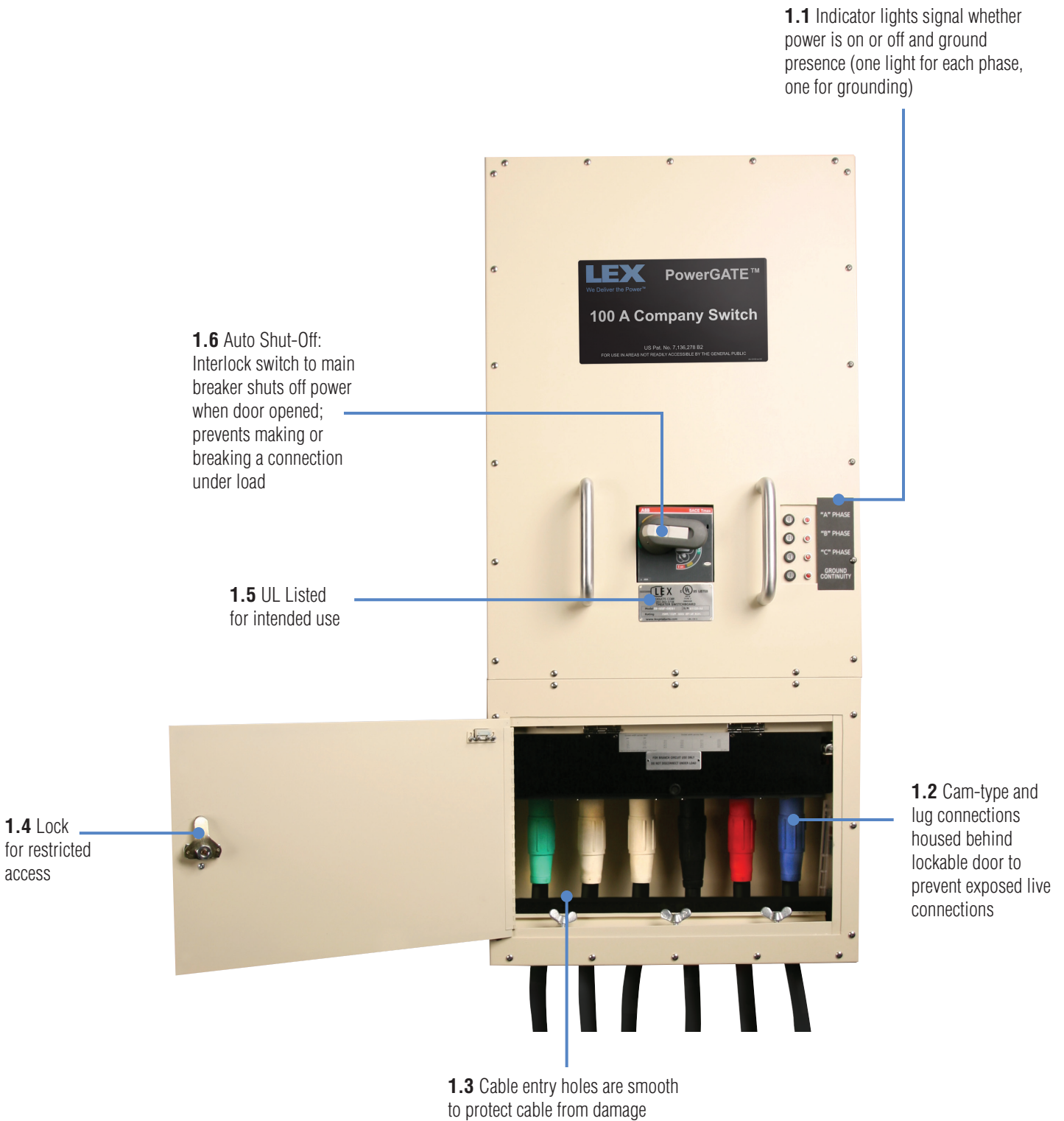


Figure 2

Safety Switch Receptacle Combination

2.5 Built and Listed to be wired via conduit to a Listed receptacle box only; not for use with portable equipment

2.4 Designed to be used continuously at only 80% of rating

2.3 Free-hanging tails leave potentially live connections exposed to unauthorized access



2.1 Lack of indicator lights leaves power status unknown to users when door is closed

2.2 Absence of door lock enables unauthorized entry and contact with live connections

Resettable Overcurrent Protection

For reliable overcurrent protection, the PowerGATE™ Company Switch features an electronic circuit breaker with a 65,000 AIC (Amps Interrupting Capacity) Rating (Figure 3.2). This means that the circuit breaker can withstand a short circuit of at least 65,000 Amps and continue to function. This high AIC Rating is frequently required in locations where significant fault current is available, which is typically near the power entrance or transformer in a building.

In the case of overloading a circuit, the circuit breaker, which is electronic trip 100% rated, can be reset as soon as the overload has been removed (Figure 3.1). On the contrary, safety switch receptacle combinations most typically employ fuses as the overcurrent protection. In this case, if a fuse blows, a new fuse has to be located and the switch has to be opened to replace it. If no replacement fuse is readily available, an entertainment venue could face a situation where the show can't go on.

Bare Lugs and Cam-type Connections Available

PowerGATE™ Company Switches have both Cam-type receptacles and lugs for bare end wire (Figure 4.1). Although Cam-type connectors are the entertainment industry standard, there are occasions where equipment arrives at a venue with different connectors, or no connectors, on the feeder cables. In that case, the bare end lugs can be safely wired to make the connections. The bare end lugs and the Cam-type receptacles are located in the same lockable wiring chamber and allow all cables to drape downward out of the unit, delivering exceptional space-savings. This feature is unique to the PowerGATE™ Company Switch.

The lugs or terminal screws of safety switches are not intended for use with portable equipment, and such practice would be a violation of the product listing and the National Electrical Code.

Electronic Circuit Breaker vs. Thermal Magnetic Circuit Breakers

A key beneficial feature of the PowerGATE™ Company Switch is its “intelligent” electronic circuit breaker. This circuit breaker measures the current in the circuit and signals the trip mechanism when the current goes over the set limit. Typical circuit breakers rely on a thermal element and a magnetic element to sense an overcurrent and trip the circuit (Figure 3.2).

In addition, the accuracy of the thermal element drifts as the ambient temperature changes, meaning a 100 Amp thermal magnetic circuit breaker could respond like a 125 Amp circuit breaker in below-freezing conditions or an 80 Amp circuit breaker on a hot summer day. Unlike thermal magnetic circuit breakers, variations in ambient temperatures will not affect the electronic circuit breakers to prematurely or falsely trip at high temperatures. This is particularly critical in entertainment applications where high ambient temperatures can occur and a false trip can be highly undesirable. Not all company switch brands utilize electronic breakers.

The safety switch receptacle combination typically uses fuses, which are less sensitive to false trip due to high ambient temperatures (Figure 5.4). If a situation arises where a molded case circuit breaker is installed instead of the safety switch, it will most likely be the thermal magnetic type, which is susceptible to false trip due to high ambient temperatures.

100% Rated Circuit Breakers vs. 'Normal' Circuit Breakers

Normal circuit breakers are designed to operate only at the current rating marked on them for brief periods of time. Therefore running these at their designated rating continuously will lead to premature failure. Unlike thermal magnetic breakers that are 80% rated, 100% rated circuit breakers are designed and tested specifically to be able to operate for long periods of time at their labeled rating (Figures 2.4 and 3.2).

Unmatched Regulatory Safeguards

The PowerGATE™ Company Switch is UL Listed for the United States and Canada for entertainment applications, specifically (Figure 1.5). In addition, Listed PowerGATE™ Company Switches meet all National Electrical Code requirements. While an AHJ (Authority Having Jurisdiction; typically a local electrical inspector) would likely scrutinize the use of an unlisted safety switch receptacle combination, the probability of regulatory impediments surrounding the use of a Listed company switch is very low. In the case of the PowerGATE Company Switch, issues can be addressed with a phone call to Lex Products' 24/7 technical support line.

A safety switch receptacle combination must be a Listed safety switch wired with conduit to a Listed receptacle box by a licensed electrician to meet NEC requirements. If this is not the case, the application can be challenged by the AHJ, and result in inconvenient interruptions and delays (Figure 2.5).

Additional PowerGATE™ Company Switch Features and Benefits

The PowerGATE™ Company Switch has additional features that set it apart from the safety switch. Unlike safety switches, the Company Switch features four indicator lights on the outside of the enclosure which inform users as to whether the power is on or off for all three phases and one grounding connection (Figures 1.1 and 2.1). On the inside of the enclosure, a chamber light turns on automatically when the enclosure door is opened, allowing for better visibility while making connections (Figure 4.2).

The enclosure features a strain relief for bare wire tie-ins, which secures the cable connections and prevents cables from being pulled out. Also, where safety switches have rough metal edges around the knockout holes (Figure 5.3), which can damage cables, the Company Switch has smooth openings to help protect the cables (Figure 1.3).

Figure 3

PowerGATE™ Company Switch

3.1 Circuit breaker handle allows breaker to be re-set without opening enclosure

3.2 100% Rated electronic circuit breaker: 65,000 AIC Rating

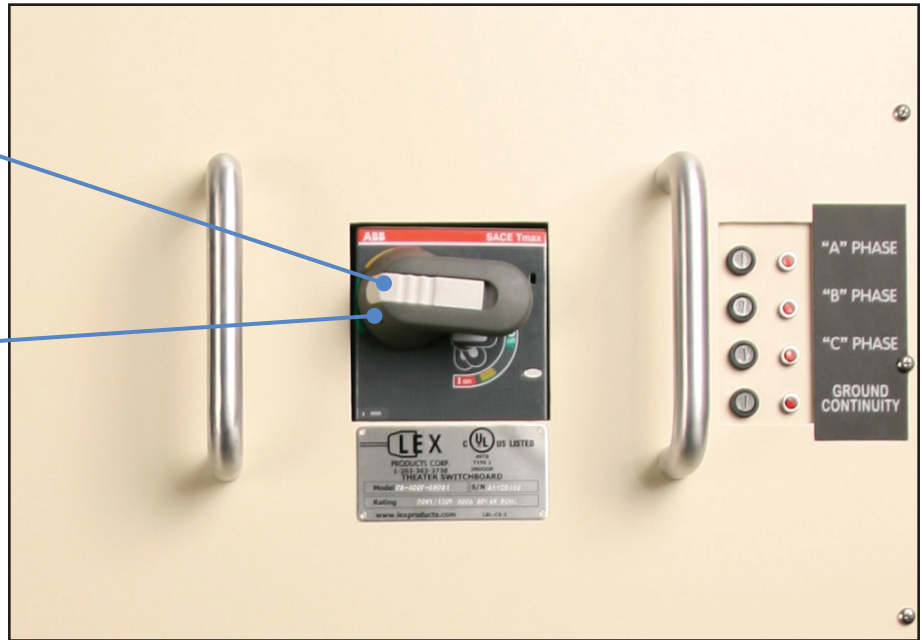


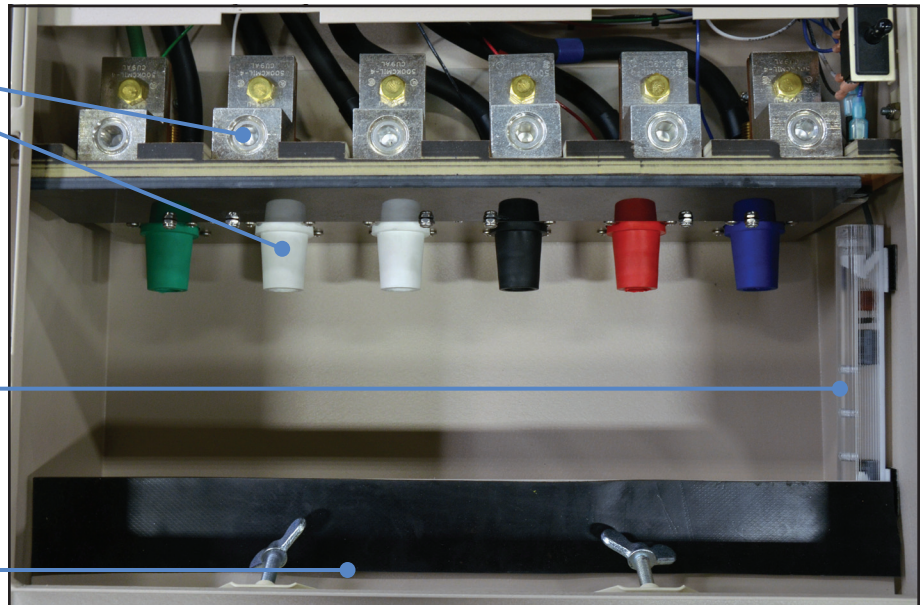
Figure 4

PowerGATE™ Company Switch

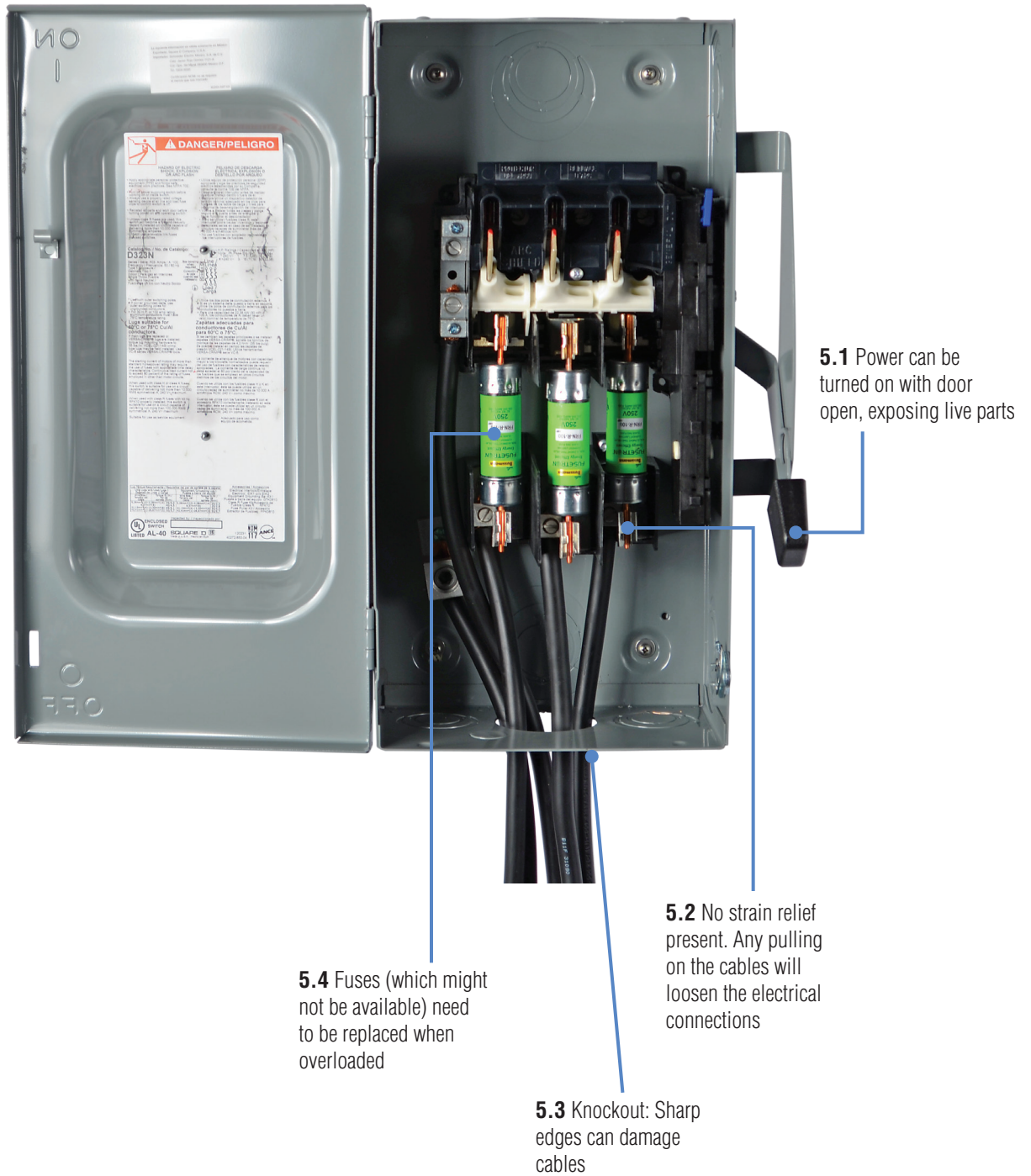
4.1 Cam-type receptacle and lug combination for bare end wire

4.2 Automatic chamber light enhances visibility when making connections

4.3 Strain relief secures cable connections and prevents cables from being pulled-out of the connection lugs



Safety Switch Receptacle Combination



Company Switch vs. Safety Switch Receptacle Combination: No Competition

When comparing the benefits of a PowerGATE™ Company Switch to those of a safety switch receptacle combination, it is indisputable as to which option provides the greatest enhanced safety, convenience and overall long term value.

The multitude of advantages delivered with the PowerGATE™ Company Switch, ranging from access restrictions and other safety features to its UL Listing and NEC compliance, provide the evidence and clarity needed to understand why the Company Switch is the preeminent choice for applications where access to relatively high amounts of electrical power in entertainment and event venues.

With a range of Company Switches available in 100 to 400 Amp ratings, Lex Products also offers a NEMA 3R Weather Resistant version. In 2012, the company introduced a new model with an IEC 60309 receptacle, which is available in 60 and 100 Amp ratings.

PowerGate™ Company Switch NEMA 3R Weather Resistant Version



About Lex Products

Lex Products Corporation is a leading manufacturer of innovative power distribution and control systems for demanding markets, including entertainment, industrial and the military. Founded in 1989, the company specializes in portable power systems including distribution boxes, cable assemblies, cable protectors and other products, designed to withstand rough use and harsh environments. Lex Products is ISO 9001:2008 certified for all production, operations and support services across its three facilities.

Headquartered in Shelton, Connecticut, the company also has offices in Sun Valley, California. The company was ranked in the 2011 Inc. 5000, and ranked 72nd for growth in the manufacturing segment. To learn more about Lex Products, please visit www.lexproducts.com.

LEX

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